Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_

**Notes Questions for the Unit 4, Part 1 Notes – Atomic and Molecular Structure**

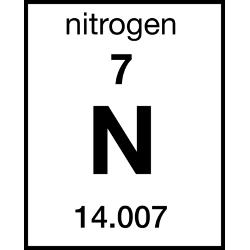
Mrs. Krouse, AP Biology, 2015-2016

***Practice Questions:*** *Answer the following questions thoroughly and accurately.*

***Practice Questions:*** *Answer the following questions thoroughly and accurately in preparation for your Daily Biology Assessment.*

1. Explain the differences between the following types of bonds: ionic, non-polar covalent, polar covalent, hydrogen.

2. Explain the difference between an ion and an isotope.

3. The image to the right shows nitrogen’s information from the periodic table of elements. Indicate the following values for nitrogen based on the image.

Atomic Mass:

Atomic Number:

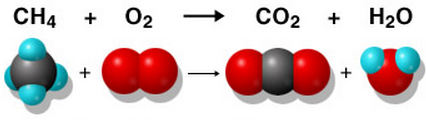
Number of Protons:

Number of Neutrons:

Number of Electons:

4. What happens to the chemical bonds within compounds during a chemical reaction?

5. Identify the reactants and products of the chemical reaction shown below.



6. Each atom has a particular electronegativity—defined as the attraction of the protons in the nucleus to the electrons in the energy shells. An atom’s level of electronegativity results in the electrons in the energy shells being held to the nucleus of the atom with a particular “tightness”.

When an atom has a much higher electronegativity than another atom, it can actually “steal” one or more electrons from the second atom, resulting in an ionic bond. When the electronegativity difference between two atoms is greater than or equal to 1.8, the bond between these atoms is considered ionic.

When an atom has a slightly higher electronegativity than another atom, it will share electrons with the other atom, but it will hold them a little more tightly. This will result in a slight negative charge on the first atom and a slightly positive charge on the second atom. This is called a polar covalent bond. When the electronegativity difference between two atoms is between 0.5 and 1.7, the bond between these atoms is considered polar covalent.

When two atoms have approximately equal electronegativities, they will share electrons evenly. This is called a non-polar covalent bond. When the electronegativity difference between two atoms is less than or equal to 0.4, the bond between these atoms is considered nonpolar covalent.



The molecule diagrammed to the right can also be represented by the formula CH3COOH:

Identify each of the bonds in the image to the right as ionic, polar covalent, or nonpolar covalent. Explain each of your choices. You will need to know the electronegativities of carbon, hydrogen, and oxygen, which are given below.

(Note: The bonds you must describe are the bonds between carbon and hydrogen, carbon and carbon, carbon and oxygen, and oxygen and hydrogen.)

|  |  |
| --- | --- |
| **Element** | **Electronegativity** |
| Carbon | 2.5 |
| Hydrogen | 2.1 |
| Oxygen | 3.5 |

7. Which one of the atoms shown would be most likely to form a cation (a positively charged ion) with a charge of +1? Circle your choice and provide a written explanation. *(This is NOT in the notes. However, you learned about this in chemistry class. Remember that the first energy shell closest to the nucleus “wants” to have two electrons, and the second energy shell “wants” to have eight electrons.)*

